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Shephard, M.D. and Mundraby, K., 2003. Assisting diabetes management through point-of-care HbA1c testing - the QAAMS program for Aboriginal health workers. *Aboriginal and Islander Health Worker Journal*, 27(4), 12-18.

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# Assisting Diabetes Management through Point-of-Care HbA1c Testing - The 'QAAMS' Program for Aboriginal Health Workers

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## Introduction

Diabetes has had a devastating impact on the health of Indigenous people throughout the world. In Australia, Aboriginal and Torres Strait Islander people suffer between 12 to 17 times more deaths due to diabetes than non-Indigenous people. In many Aboriginal communities rates of Type 2 diabetes range between 15 to 30%. Diabetes itself is a significant risk factor for heart disease and is the major cause of end-stage renal disease in Aboriginal people.

This article describes a national program called QAAMS (or Quality Assurance for Aboriginal Medical Services) that was developed to assist the management of Aboriginal people with diabetes. Aboriginal Health Workers administer the program on a day-to-day basis. The unique feature of the program is that it uses a point-of-care medical instrument (called the DCA 2000) to measure a test for the long-term control of diabetes (called Haemoglobin A1c).

Point-of-care medical instruments are small, portable machines that can measure a range of pathology tests for chronic diseases on just a drop of blood or urine on-site in the community. As well as these advantages, point-of-care testing is particularly suited to the Aboriginal health care setting for the following reasons:

- Through appropriate training, Aboriginal Health Workers can perform point-of-care tests on-site, thereby empowering them to take even greater responsibility for the health of their own community members
- Immediate availability of result means that the client can see the doctor straight away and doesn't have to come back for a follow-up visit
- By conducting the tests on-site, ownership and control of health information remains with the community, a factor crucial to the acceptance and success of health programs for Indigenous people.

The point-of-care instrument used in the QAAMS program, the DCA 2000 (marketed by Bayer Australia), measures Haemoglobin A1c on just a fingerprick of blood and provides an on-site result in only six minutes (Figure 1).



**Figure 1: The Bayer DCA 2000 point-of-care medical instrument.**

Haemoglobin A1c (also known as HbA1c or sugar-Hb) provides a measure of a person's diabetes control over the preceding three months. HbA1c can be described as sugar that is attached to haemoglobin in the red blood cells of the body. In a person without diabetes, HbA1c makes up around 5-6% of the haemoglobin in red cells. In a person with diabetes, the amount of HbA1c can be much higher. The higher the HbA1c above 7%, the poorer the diabetes control, and the greater the risk of developing the (micro- and macro-vascular) complications of diabetes (such as kidney disease, eye disease, stroke and amputation of limbs). The target for optimal control of diabetes is an HbA1c of 7%. Ideally, every person with diabetes should have his or her HbA1c checked every three months.

## The QAAMS program and how it began

The QAAMS program arose from a recommendation of the National Diabetes Strategy, commenced as a pilot in June 1999, and is now fully integrated into mainstream Aboriginal health care in Australia.

The program has been a joint partnership (and very much a team effort) between a number of groups over the years - the National Aboriginal Community



Controlled Health Organisation (NACCHO), the Commonwealth Department of Health and Ageing's Office for Aboriginal and Torres Strait Islander Health (OATSIH) and the Diagnostics and Technology Branch, the RCPA (Royal College of Pathologists of Australasia's) Quality Assurance Programs Pty Ltd and the Community Point-of-Care Centre at Flinders Medical Centre.

The focus of the program is the management of diabetes. Over 2300 Aboriginal patients with diabetes are involved in the program, which is being conducted in 45 Aboriginal Community Controlled Health Services (ACCHS) around Australia covering urban, rural and remote sites and representing every State and Territory (Figure 2).



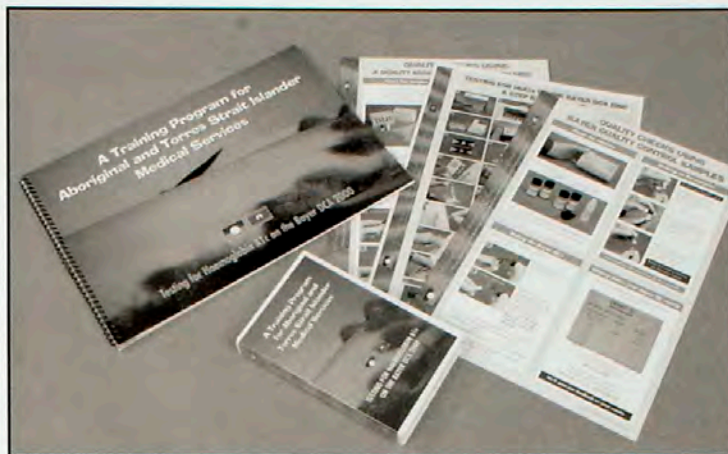
**Figure 2: General location of sites participating in the QAAMS program during 2002.**

This article has been written on behalf of the Aboriginal Health Workers from those sites, who are using and working the program at the ground level or the 'grassroots'. The ultimate success of this program has been due very much to the goodwill, hard work and commitment of the Aboriginal Health Workers at these sites and the vision of their health services.

#### **Key elements of the QAAMS program**

The program is based on the following three key elements:

- The production of an education resource package about diabetes. This comprises a book, video and a series of laminated posters about specific aspects of the program (all of which were developed in collaboration with senior Aboriginal health professionals to ensure they were culturally appropriate) (Figure 3).
- The delivery of formal training for Aboriginal Health Workers (and allied health professionals) from each site about diabetes and its complications, the HbA1c



**Figure 3: Education resources produced for the QAAMS program.**

test and control of diabetes, and practical hands-on training in how to perform an HbA1c test on the DCA 2000.

- The development of a quality assurance program to monitor the quality of results generated by the DCA machines in the field, together with a number of other quality management support services for participating sites.

With 50 DCA machines in the field, it is critical to know that the machines are generating HbA1c results that are acceptable for patient care at all times. A surveillance mechanism was therefore needed to monitor the analytical performance of the machines. To do this, a quality assurance program was developed in partnership with Jan Gill and Lloyd Penberthy from the RCPA Quality Assurance Programs Pty Ltd.

The RCPA Quality Assurance Programs Pty Ltd are internationally renowned for their work with quality assurance in laboratories and run 23 programs for more than 1000 laboratories in Australia, New Zealand and other parts of the world. However, we believe the QAAMS program is the first of its type to be developed for Indigenous people anywhere in the world.

#### **How does the QAAMS program work?**

The QAAMS program provides each service with an annual kit of 24 samples with known concentrations of HbA1c. Aboriginal Health Workers from each service test two of these samples (in a blind sense and according to a defined testing schedule) every month. Their results are then faxed to the QAAMS reporting office at Flinders Medical Centre in Adelaide. The performance of each service's DCA 2000 is monitored by comparing their QAAMS results with the pre-set target values for those quality assurance samples and with the results from all other services.

Graphical reports summarising the DCA's short - and long-term performance are then sent to each service.



**Table 1.** Median precision (CV%) achieved by Aboriginal Community Controlled Health Services and laboratories in parallel Quality Assurance Programs.

Category	Program	Cycle		
		July to Dec 2001	Jan to June 2002	July to Dec 2002
ACCHS	QAAMS	4.1%	3.9%	3.4%
Laboratories	Glycohaemoglobin	4.1%	3.7%	3.5%

By simply eyeballing the report, the service can see where their monthly result lies in relation to the target value and to all other services (that is, their peers). If the result lies within the 'goalposts' or 'limits of acceptability', then their DCA is performing well. The report builds up over time and services can also get graphical information about the long-term performance of their DCA 2000. Services have their own individual code number that ensures confidentiality of their results.

As part of the QAAMS program, other on-going support services, including an immediate telephone 'help hotline' service for sites experiencing technical difficulties or problems with their DCA 2000, is also provided.

#### Results from the quality assurance testing

Seven (7) six-monthly testing cycles have now been completed over the past three and a half years - from July 1999 to December 2002. The results from the most recently completed testing cycle (Cycle seven, July to December 2002) can be summarised as follows:

- Participation rate: 93%
- Percentage acceptable results: 86% (using limits for acceptable performance set by the program organisers, which are the same as those for the laboratory-based Haemoglobin A1c [Glycohaemoglobin] program run by the RCPA Quality Assurance Programs Pty Ltd)
- Median Precision: 3.4% (coefficient of variation, CV%).

#### How does this level of precision compare to laboratories?

As mentioned above, the RCPA Quality Assurance Programs Pty Ltd runs a parallel Haemoglobin A1c program for laboratories in Australasia. There are 75 DCA users registered in this program, which uses an identical quality assurance material to that used for QAAMS. It is therefore possible to directly compare the performance of Aboriginal Community Controlled Health Services using the DCA 2000 in the QAAMS program with laboratory users of the DCA 2000 in the Glycohaemoglobin program.

Across the past three testing cycles, the median precision achieved by Aboriginal Community Controlled Health Services in the QAAMS program has more than matched the precision base achieved by laboratories.

This is a quite outstanding achievement by the participating Aboriginal Health Workers. As the table also shows, the precision base achieved by Aboriginal Community Controlled Health Services has been generally trending downwards (improving), again a very pleasing finding.

#### How is the QAAMS program working in the field?

Participants have used the program in many different ways within the community setting. For example, some services have set up new diabetic clinics as now they can do the test on-site. Others have used the DCA for opportunistic testing in the health service, for home visits for diabetic clients, at community functions and health promotion activities, and during field visits to care for people with diabetes in outstations and distant communities serviced by health services.

#### Evaluation of the QAAMS program

In March 2001, NACCHO released an independent evaluation on the first 18 months of the QAAMS program (1). The Executive Summary concluded:

- The use of the DCA point-of-care technology provided a major opportunity to better care for and manage Aboriginal clients with diabetes within the community setting.
- The ability of the point-of-care technology to generate rapid results served as a catalyst to enhance patient self-management, while
- The simplicity of use of the DCA led to high levels of acceptance by Aboriginal health workers nationally, with over two-thirds of services expressing the view that it had raised the self-esteem of their health workers.
- Further, the sense of community control was enhanced as a result of diabetic management becoming more focussed within Aboriginal medical services.





**Figure 4:** Janine Cochrane from Biripi Medical Service, Taree, NSW and Mark Shephard at the DCA 2000 during the 2001 Workshop.

#### **Sustainability of the QAAMS program**

In December 2000, the Federal Health Minister (Dr Wooldridge) announced that a Medicare rebate could now be claimed for HbA1c tests conducted for the management of people with established diabetes in Aboriginal Community Controlled Health Services. The rebate has ensured there is a long-term sustainable funding mechanism for the program. The rebate is conditional on services continuing to participate in the QAAMS program.



**Figure 5:** Cindy Koolmatrie and Louise Dennis from the Central Australian Aboriginal Congress, Alice Springs, with Karan Lavender (QAAMS Assistant) at the 2002 Workshop.

Annual Workshops have been held for participants since 2001 (Figures 4 and 5). The Workshops provide an informal, interactive forum for participants to discuss issues about the program, meet and network with other participants, and set future directions. In addition there are opportunities for everyone to participate in a full training program, particularly new health workers that have not previously had one-on-one training.

Regional Workshops for sites from Cape York, Far North South Australia and country Victoria have also been held as the need has arisen.

#### **Transferability of the QAAMS model**

As from January 2003, the program is now available to sites from outside the non-ACCHS sector (that is, State and Territory-funded services), provided they are able to purchase a DCA 2000 and the consumables needed.

In 2003, 10 new sites have been recruited to the QAAMS HbA1c program including our first international participant, the Island of Tonga from the Western Pacific region. There remains considerable interest from other Western Pacific Islands.

The QAAMS model is transferable to other point-of-care tests and instruments. This year, with the further support of the Commonwealth Department of Health and Ageing's Diagnostics and Technology Branch, a new QAAMS program for the measurement of urine albumin:creatinine ratio (ACR) on the DCA 2000 has commenced. There are 30 Aboriginal Community Controlled Health Services enrolled in this program and urine ACR testing will be used to monitor microalbuminuria in Aboriginal patients with diabetes.

#### **Challenges for the QAAMS program**

Perhaps the biggest issue confronting the sustainability of the QAAMS programs is maintaining education, training and quality management support services to those sites experiencing high staff turnover. Since the program began, more than 70% of services now have a different health worker responsible for the program, while a further 10% have had more than two staff changes.

Having said this, some services have achieved some quite remarkable performances under very difficult circumstances. One of our services participating in the QAAMS program is located in the southern desert region of Western Australia, 700 kilometres from the nearest town. Despite the tremendous disadvantages of distance, this site has maintained a very high participation rate since the QAAMS program began in June 1999 and is regularly ranked in the top quartile for its analytical performance base.

Other challenges include ensuring the Medicare rebate is accessed maximally, promoting the availability of the program more widely, maximising the

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attendance at, and support for, the annual Workshop, and gathering more quantitative and qualitative data about the program with the help of participating sites - particularly in relation to whether point-of-care DCA 2000 HbA1c testing leads to improved health outcomes for the client.

In conclusion, the QAAMS program places Aboriginal medical services at the leading edge internationally of providing point-of-care technology to assist Indigenous communities with diabetes management and improves the capacity of services to make an impact on the burden of diabetes.

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#### Acknowledgement

The QAAMS HbA1c Program is funded by the Commonwealth Department of Health and Ageing's

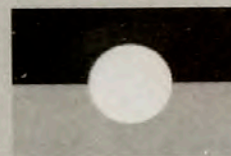
Pathology Section, Diagnostics and Technology Branch.

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## 'Come Yarn' Elders Program



#### What is it?

The 'Come Yarn' Elders program is an opportunity for Aboriginal and Torres Strait Islander Elders to come together for a luncheon and two workshops to discuss current and future Aboriginal and Torres Strait Islander community programs in Parramatta and Holroyd. The Wagon and Burra Project acknowledges the importance of Elder input into community programs. As such, participants will be offered \$100 for each workshop they attend.

#### Who should apply?

Aboriginal and/or Torres Strait Islander Elders who live, work or have a special interest in the Parramatta and Holroyd local government areas. Preference will be given to those Elders who have not had a prior association with the Wagon and Burra Project.

**Applicants should contact Cassia Community Centre Community Development Worker – Indigenous, PO BOX 274 WENTWORTHVILLE NSW 2145 Fax 9863 3547, Phone 9863 3547 or email [catsi@cassia.org.au](mailto:catsi@cassia.org.au) for an application or more information.**

**Seats are strictly limited so apply ASAP.**